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(54) METHODS AND SYSTEMS OF PROVIDING LOCAL ACCESS NUMBER CALLING FEATURES

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- (51) Int. Cl. H04W 4/00 (2009.01) H04W 24/00 (2009.01) G01S 1/24 (2006.01) H04M 15/00 (2006.01) H04W 8/26 (2009.01) H04W 48/08 (2009.01)

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(52) U.S. Cl.

(58) Field of Classification Search

None

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

4,751,728 A 6/1988 Treat 4,799,253 A 6/1989 Stern et al. (Continued)

FOREIGN PATENT DOCUMENTS

DE 10341737 A1 4/2005 EP 1179941 A 2/2002

(Continued)

OTHER PUBLICATIONS

Saravanan Shanmugham, et al., Daniel C. Burnett, "Media Resource Control Protocol Version 2(MRCPv2)", IETF Standard-Working-Draft, Internet Engineering Task Force, IETF, vol. Speechsc, No. 6, pp. 1-176 (2005).

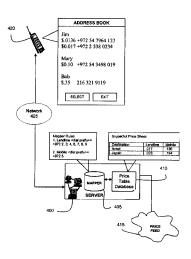
(Continued)

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(57) ABSTRACT

In an embodiments a method of providing a local access number to a subscriber may include receiving subscriber locale information indicating a location of a subscriber, mapping the subscriber locale information to one or more local access numbers, identifying, from the one or more local access numbers, a local access number corresponding to the subscriber locale information and transmitting the identified local access number to the subscriber's mobile device.

12 Claims, 9 Drawing Sheets



US 9,100,500 B2 Page 2

(56) References Cited		2005/0025043			Mussman et al.	
11.6	DATENIT	DOCUMENTS	2005/0027867 2005/0033852			Mueller Tenhunen
0.3.	PALEINI	DOCOMENTS	2005/0036597			Kobrosly et al.
5,570,417 A	10/1996	Bvers	2005/0059418	A1	3/2005	Northcutt
5,577,100 A		McGregor et al.	2005/0070230			Das et al.
5,635,940 A *		Hickman et al 342/389	2005/0102257			Onyon et al.
5,848,128 A	12/1998		2005/0138571 2005/0157858	Α1 * Δ1	0/2005 7/2005	Keskar et al 715/789 Rajagopalan et al.
5,878,122 A 5,913,162 A		White et al. Gourdin et al.	2005/0163065		7/2005	
5,946,618 A *		Agre et al 455/428	2005/0171799			Hull et al.
6,044,263 A *		Valentine et al 455/414.1	2005/0182798			Todd et al.
6,188,762 B1		Shooster	2005/0198031			Pezaris et al. Appelman et al.
6,205,126 B1 *		Moon 370/329	2005/0198172 2005/0198365		9/2003	
6,333,931 B1 6,564,261 B1		LaPier et al. Gudjonsson et al.	2005/0221847			Brehler et al.
6,618,590 B1*		Howe 455/445	2005/0249344			Mueller et al.
6,678,364 B2	1/2004	Ruckart	2005/0273512		2/2005	
6,687,362 B1 *		Lindquist et al 379/218.01	2006/0018306 2006/0018311			Nishida et al. Kobayashi et al.
6,697,858 B1		Ezerzer et al.	2006/0018311			Nishida et al.
6,707,811 B2 6,751,457 B1		Greenberg et al. Martin	2006/0026288			Acharya et al.
6,775,375 B1		Bhusri	2006/0029042			Nishida et al.
6,850,762 B1		Ala-Luukko et al.	2006/0029043			Nishida et al.
6,917,610 B1		Kung et al.	2006/0029046 2006/0031368			Nishida et al. Decone
6,937,873 B2		Levy et al. Howe	2006/0031308			Whistler et al.
7,039,164 B1 7,085,260 B2		Karaul et al.	2006/0077932			Takeda et al.
7,099,652 B2		Brown et al.	2006/0159456			Gumaste et al.
7,110,772 B1*	9/2006	Wu 455/456.1	2006/0168326			Baldwin et al.
7,127,488 B1		Scott et al.	2006/0173961 2006/0205400			Turski et al. Kiyomoto
7,130,620 B2		Forman et al.	2006/0203400			Brooke et al.
7,139,370 B1 7,243,075 B1	11/2006 7/2007	Shaffer et al.	2006/0236388			Ying et al.
7,257,837 B2		Xu et al.	2006/0246877			Kashanian et al.
7,274,786 B2	9/2007	Fleischer, III et al.	2006/0248146		1/2006	
7,280,652 B2		Bocking et al.	2006/0270392 2006/0270400			Scott et al. DaSilva et al.
7,369,650 B1		Bhusri	2007/0005776			Hansen et al.
7,395,057 B2 7,436,820 B2		Awasthi et al. Beck et al.	2007/0016682			Hodgson
7,471,692 B1		Erickson	2007/0060100			Watler et al.
7,480,723 B2		Grabelsky et al.	2007/0064607			Moon et al.
7,529,231 B2		Soo et al.	2007/0071006 2007/0112964			Bosch et al. Guedalia et al.
7,548,611 B2		Howe et al. Chesnais et al.	2007/0112304			Guedalia et al.
7,620,404 B2 7,634,509 B2		Onyon et al.	2007/0162350			Friedman
7,701,883 B2		Beckemeyer	2007/0281676			Borras et al.
7,738,861 B2		Fournier	2007/0287430			Hosain et al.
7,974,610 B2		Nachum	2008/0003964 2008/0013531			Alperin et al. Elliott et al.
8,116,836 B2 8,391,848 B2	2/2012	Kı Guedalia et al.	2008/0037524			Koch et al.
2001/0038624 A1		Greenberg et al.	2008/0056208			Hinrikus et al.
2002/0013163 A1		O'Prey	2008/0056235			Albina et al.
2002/0099670 A1		Jakobsson	2008/0070579			Kankar et al.
2002/0120760 A1		Kimchi et al.	2008/0076409 2008/0096592			Hinrikus et al. Waytena et al.
2002/0129103 A1 2002/0169984 A1		Birkler et al. Kumar et al.	2008/0139210			Gisby et al.
2002/0103344 A1 2002/0193107 A1		Nascimento	2008/0159261	Al	7/2008	Bessis
2003/0013441 A1	1/2003	Bhogal et al.	2008/0159515		7/2008	
2003/0046404 A1		O'neill et al.	2008/0166999 2008/0167019			Guedalia et al. Guedalia et al.
2003/0046405 A1		O'neill et al.	2008/0167020			Guedalia et al.
2003/0050051 A1 2003/0060211 A1*		Vilander Chern et al 455/456	2008/0181165			Guedalia et al.
2003/0091024 A1		Stumer	2008/0188227			Guedalia et al.
2003/0115138 A1		Brown et al.	2008/0192910			Guedalia et al.
2003/0118175 A1		Hariri et al.	2008/0244023 2008/0248795			Guedalia et al. Petersen et al.
2003/0148790 A1		Pappalardo et al.	2008/0248793			Caron et al.
2003/0190025 A1 2004/0019539 A1		Okamura et al. Raman et al.	2008/0305782			Guedalia et al.
2004/0037396 A1		Gray et al.	2009/0190738			Guedalia et al.
2004/0044771 A1	3/2004	Allred et al.	2010/0080376			Hartley et al.
2004/0143669 A1		Zhao et al.	2011/0312308		2/2011	
2004/0156394 A1		Westman	2013/0137421	AI	5/2013	Guedalia et al.
2004/0165714 A1 2004/0202117 A1		Pinault Wilson et al.	EOI	DEIGN	DATE	NT DOCUMENTS
2004/0202117 A1 2004/0203643 A1		Bhogal et al.	rOi	KEIGN	FALE	NI DOCUMENTS
2004/0213209 A1		O'Conner et al.	EP	15172	56 A2	3/2005
2004/0229644 A1		Heie et al.	EP	17015	69 A	9/2006
2004/0235509 A1	11/2004	Burritt et al.	GB	23911	35 A	1/2004

References Cited					
FOREIGN PATE	NT DOCUMENTS				
9723083 WO 98/47298 A3 WO 9934628 A 0198867 A2 0215030 A1 0221779 A1 0239237 A WO 03032613 A 03094011 A1 2005065296 A 2006039552 A2 WO 2006/044654 A 2007001850 A1 2007005124 A2	6/1997 10/1998 7/1999 12/2001 2/2002 3/2002 5/2002 4/2003 11/2003 7/2005 4/2006 4/2006 1/2007 1/2007 3/2007				
2008013642 A2	1/2008				
	9723083 WO 98/47298 A3 WO 98/47298 A3 WO 9934628 A 0198867 A2 0215030 A1 0221779 A1 0239237 A WO 03032613 A 03094011 A1 2005065296 A 2006039552 A2 WO 2006/044654 A 2007001850 A1 2007005124 A2 2007025373 A 2007109559 A2				

OTHER PUBLICATIONS

Sinnreich, et al., "SIP telephony device requirements and configuration draft-sinnreich-sipdev-req-07.txt", IETF Standard-Working-Draft, Internet Engineering Task Force, No. 7, pp. 1-37 (2005). Griffin et al., "Integrating SIP, presence and FTP to provide wireless multimedia messaging", Wireless Communications and Networking Conference, IEEE Communications Society, 4:2581-2586 (2004). Handley et al., "RFC 2543 SIP: Session Initiation Protocol", IETF Standard, Internet Engineering Task Force, pp. 1-153 (1999).

Handley et al., "SIP: Session Initiation Protocol", IETF, Standard-Working-Draft, Internet Engineering Task Force, vol. 4, pp. 1-83 (1997).

Petrie, Pingtel Corp., A Framework for SIP User Agent Profile Delivery draft-iet f-sipping-config-framework-02.txt., IETF Standard-Working-Draft, Internet Engineering Task Force, No. 2, pp. 1-22 (2004).

Colman Ho, "Voice Over Internet Protocol (VoIP) Overview", Presentation to TSACC, Mar. 23, 2004; www.isacc.ca/isacc/_doc/Book%2017%20-%202004/TSACC-04-31305.ppt.

Alcatel-Lucent, "Alcatel-Lucent OmniPCX Enterprise Communication Server: Delivering powerful, reliable and scalable IP communications to drive your 21st century business", 2007. http://www1.alcatel-lucent.com/com/en/appcontent/opgss/ENT_

OmniPCX%20Enterprise_datasheet_1007_EN_tcm228-1353221635.pdf.

SIP Connect, "CableLabs Proposal for SIP Connect 1.1", 2007; http://www.sipforum.org/component/option.com_docman/task,doc_view/gid,149/Itemid,75/.

NST, New Standard Telephony, Convergence Simplified, Company Profile, NST 2005; http://www.ns-tel.com/files/NST_Company_Profile.pdf.

Janne Lundqvist et al., Messaging-over-IP—A network for messaging and information services; http://www.ericsson.com/ericsson/corpinfo/publications/review/1999_03/files/1999035.pdf.

Case Study, Intel Centrino, Mobile Technology, Intel Xeon Processor MP, Shanghai GM, "Seamless Communications", http://www.intel.com/netcomms/technologies/voice/310998.pdf.

Kundan Narendra Singh, Thesis, "Reliable, Sealable and Interoperable Internet Telephony", Columbia University, 2006; http://www1.cs.columbia.edu/~kns10/publication/thesis.pdf.

Intel Communications Alliance, "TeleSym and Intel Deliver Voice-over-Internet-Protocol (VoIP) Enterprise Communication Solution", Jun. 2004; http://www.intel.com/network/csp/pdf/9003wp.pdf.

Sinnreich/Pulver Com H. et al.: "SIP Telephony Device Requirements and Configuration; draft-sinnreich-sipdev-req-08.txt", IETF Standard-Working-Draft, Internet Engineering Task Force, IETF, CH, No. 8, Oct. 1, 2005, XP015043067 ISSN: 0000-0004.

Rosenberg, J. et al.: "SIP: Session Initiation Protocol" 20020601; 20020600; Jun. 1, 2002, pp. 1-269, XP015009039.

Schulzrinne Columbia University B. Volz Ericsson H: "Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers; rfc3319.txt", IETF Standard, Internet Engineering Task Force, IETF, CH. Jul. 1, 2003, XP015009189; ISSN: 0000-0003.

^{*} cited by examiner

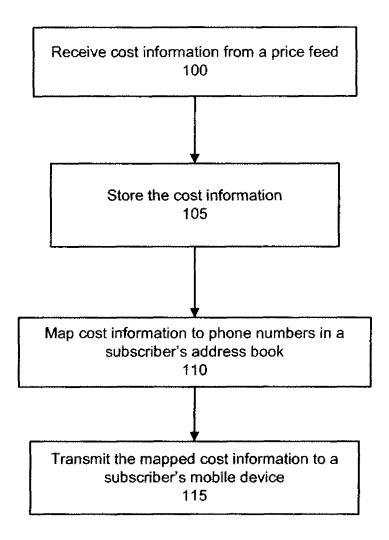


FIG. 1

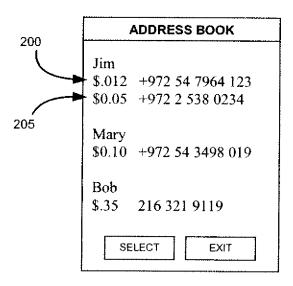


FIG. 2

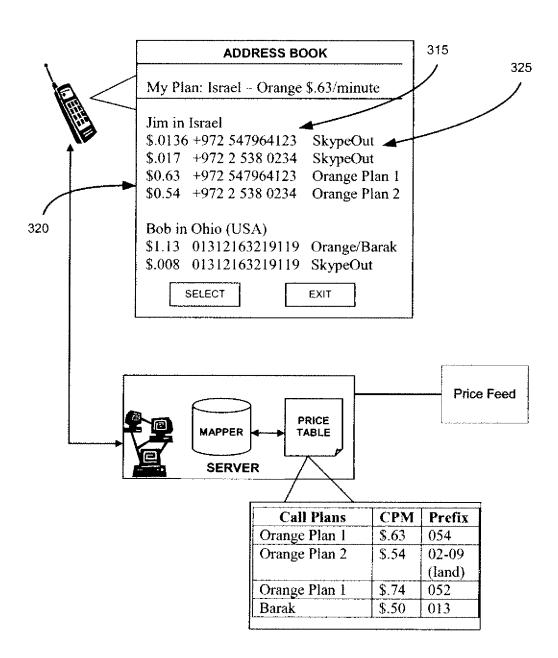


FIG. 3

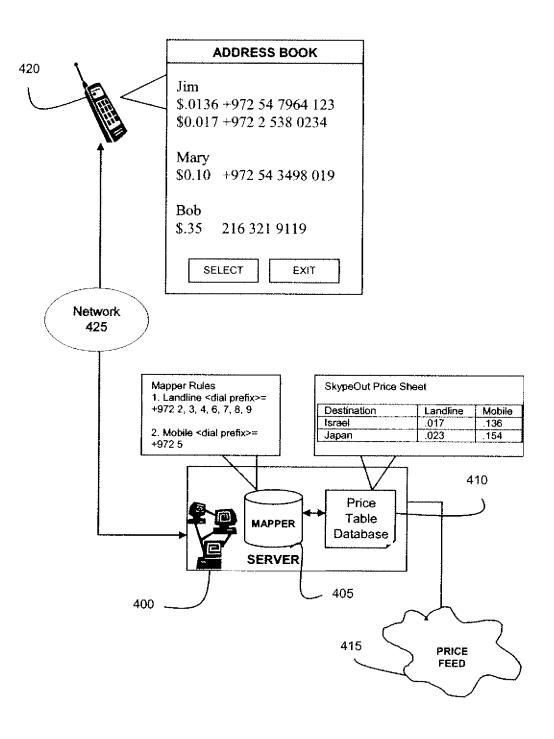


Fig. 4

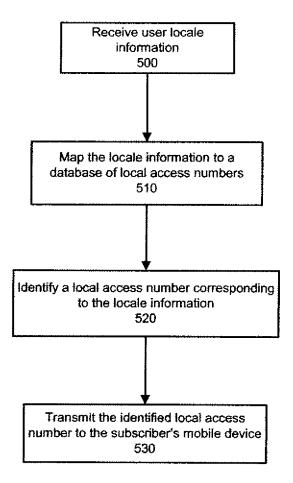


FIG. 5

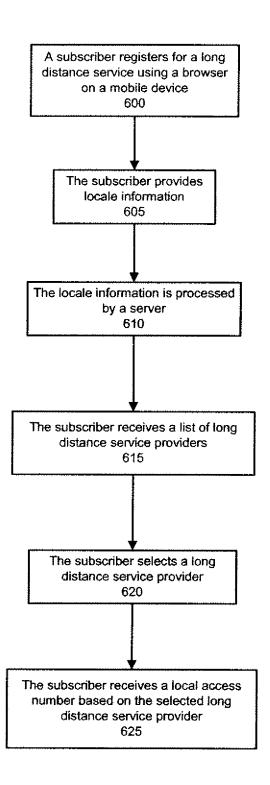


FIG. 6

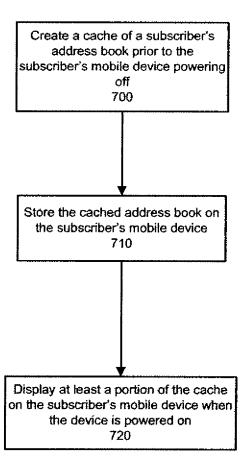


FIG. 7

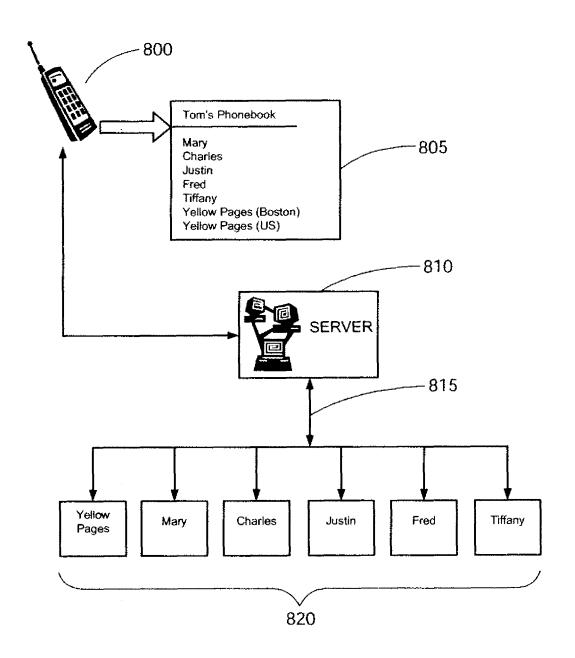


FIG. 8

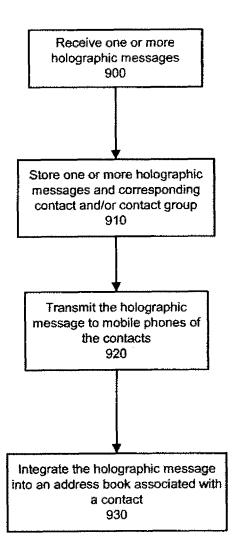


FIG. 9

METHODS AND SYSTEMS OF PROVIDING LOCAL ACCESS NUMBER CALLING FEATURES

CLAIM OF PRIORITY

This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Application No. 60/883,841, filed Jan. 8, 2007, U.S. Provisional Application No. 60/884,045 filed Jan. 9, 2007, U.S. Provisional Application No. 60/889,305, filed Feb. 12, 2007, U.S. Provisional Application No. 60/889,959, filed Feb. 15, 2007, U.S. Provisional Application No. 60/896, 003, filed Mar. 21, 2007, U.S. Provisional Application No. 60/908,726, filed Mar. 29, 2007, U.S. Provisional Application No. 60/940,758, filed May 30, 2007, U.S. Provisional Application No. 60/942,557, filed Jun. 7, 2007, U.S. Provisional Application No. 60/945,931, filed Jun. 24, 2007, and U.S. Provisional Application No. 60/947,963, filed Jul. 4, 2007, the entireties of which are incorporated by reference herein.

BACKGROUND

As the mobile telecommunication industry grows, mobile subscribers are becoming increasingly more aware of their leverage in the market. They carefully compare service providers and call plans, and make educated choices before subscribing to a carrier and a service. Subscribers also continuously seek new and improved features to integrate into their mobile service such as enhanced chat, long distance service options, customized graphical user interfaces and the like.

Despite being informed consumers, mobile subscribers are often disadvantaged in the mobile market. For example, although a subscriber may be knowledgeable about their own calling plan subscription, subscribers are usually unaware of the cost per minute of a call to the calling destination. This 35 puts a mobile subscriber at a disadvantage in making educated and economical calling choices.

Mobile subscribers would also welcome more long distance service options. A subscriber to a telecommunication carrier service typically needs a local access number to utilize 40 the service. This usually involves selecting a number from a list of regional or area numbers, such as a preprinted list on a calling card, to find the access number closest to the subscriber's current location. The subscriber dials the local access number and is usually connected to a long distance service 45 provider via a telephony network. Typically, the subscriber can then enter a target long distance telephone number, and the long distance service provider will route the call to a subscriber-specified number. The current approach has many disadvantages however, such as having to purchase a phone 50 care and locating a local access number. In addition, a subscriber who accidentally places a call using a non-local access number may incur long distance charges.

It is common for a subscriber to experience a significant delay after powering on his mobile device before he is able to 55 access updated contact information in his address book. This is because the mobile device must contact and retrieve an updated contact list from a server. As such, subscribers may desire to access his address book while the contact information is being updated.

To keep pace with the constant evolution of mobile telephony, mobile subscribers are treated to a variety of applications designed to optimize their mobile communication experience. For example, subscribers can access the Internet with the mobile device, send chat messages to their contacts and 65 the like. Subscribers can glean relevant and up-to-date information about their contacts in their address books by viewing

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presence-statuses, away messages, sometimes referred to as status messages, mood messages or the like. However, it is common for a subscriber's status message to read the same regardless of which contact views it. As such, a subscriber cannot customize his status message based on the contact who is viewing it.

SUMMARY

Before the present methods are described, it is to be understood that this invention is not limited to the particular systems, methodologies or protocols described, as these may vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present disclosure which will be limited only by the appended claims.

In an embodiment, a method of providing a local access number to a subscriber may include receiving subscriber locale information indicating a location of a subscriber, mapping the subscriber locale information to one or more local access numbers, identifying, from the one or more local access numbers, a local access number corresponding to the subscriber locale information and transmitting the identified local access number to the subscriber's mobile device.

In an embodiment, a method of placing a call using a local access number may include transmitting subscriber locale information to a processor, receiving, from the processor, one or more long distance service providers, selecting a long distance service provider from the plurality of long distance service providers and receiving a local access number based on the selected long distance service provider.

In an embodiment, a system for providing a local access number to a subscriber may include one or more mobile devices, a processor in communication with the one or more mobile devices and a processor-readable storage medium comprising locale information and one or more local access numbers, wherein the processor-readable storage medium is in communication with the processor.

BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 depicts a flow chart for implementing an exemplary call-cost feature on a mobile device.
- FIG. 2 depicts a mobile device display of exemplary cost information according to an embodiment.
- FIG. 3 depicts an exemplary system of providing cost information according to an embodiment.
- FIG. 4 depicts an exemplary system of providing cost information according to an embodiment.
- FIG. 5 illustrates flow chart for assigning an exemplary local access number according to an embodiment.
- FIG. 6 illustrates a method of placing an exemplary long distance call using a local access number according to an embodiment.
- FIG. 7 illustrates a flow chart for an exemplary method of accessing contact information on a subscriber's mobile device according to an embodiment.
- FIG. 8 illustrates an exemplary system for implementing mobile address book interaction according to an embodiment.
- FIG. 9 illustrates an exemplary method of providing contact information according to an embodiment.

I. DETAILED DESCRIPTION

FIG. 1 illustrates a flow chart for implementing an exemplary call-cost feature on a mobile device. A mobile device

may include mobile or portable devices such as cellular phones, PDAs, media players or the like. A mobile device may have a processor and a processor-readable storage medium in communication with the processor.

As illustrated by FIG. 1, a price table database may receive 5 100 cost information from a price feed. A price feed provides real time pricing information for a product or service. For example, stock prices may be available to an online trader via a price feed.

In an embodiment, the price table database may be housed 10 on a computing device, such as a server, and the cost information may include the cost per minute for a plurality of calling destinations or the like. Table 1 illustrates an exemplary price table database according to an embodiment.

TABLE 1

Calling Destination	Cost per minute
Canada	\$0.33/minute
France	\$0.56/minute
Israel	\$0.35/minute
United States	\$0.15/minute

The price table database may receive 100 cost information from the price feed on a regular basis. In an embodiment, the 25 price feed may include a rate sheet provided by a telephone service provider.

In an embodiment, at least a portion of the received cost information may be stored 105 in the price table database. For example, the price table database may receive a cost-per- 30 minute for calling Canada. If the price table database does not currently include a cost-per-minute for Canada, the cost information may be added to the price table database. If the price table database includes a different cost-per-minute for Canada, the stored cost information may be replaced with the 35 cost information from the price feed. In an embodiment, if the received cost information associated with a calling destination is less than the stored cost information associated with the calling destination, an alert may be generated. The alert may be used to notify a subscriber of the price discount 40 associated with the particular calling destination. In an embodiment, the server may transmit the alert to a subscriber's mobile device to notify the subscriber of the price dis-

A mapper may use the cost information contained in the 45 price table database to map 110 cost information to one or more phone numbers in a subscriber's address book. In an embodiment, the mapper may utilize pre-defined rules to map 110 cost information to a contact number. A contact is an entry in an address book that is accessible by a mobile device. 50 A contact number is a mobile device number associated with a contact. In an embodiment, the mapper may map 110 cost information to one or more contact numbers using pre-defined rules. The pre-defined rules may be used to determine, for example, a calling destination, whether the phone number 55 belongs to a landline or a mobile device, or the like. For example, in Israel, landlines are provisioned with the country code +972 followed by an area code ranging from '1' to '9', with the exception of '5.' Mobile phone numbers typically begin with '5.' If a subscriber has the phone number "972-2- 60 5388-0234" in his address book, the mapper may use one or more pre-defined rules to determine the contact number is a landline number is Israel. The mapper may use this information to map the corresponding cost per minute to one or more contact numbers in a subscriber's address book.

In an embodiment, the mapped cost information may be transmitted to the subscriber's mobile device for display to 4

the subscriber. FIG. 2 depicts a mobile phone display of exemplary cost information according to an embodiment. As illustrated, the cost to call one or more contacts in a subscriber's address book may be displayed. For example, calling Jim on his mobile phone costs \$0.0136/minute 200, whereas calling Jim on his landline phone costs \$0.017/minute 205. The subscriber may use this information to make an informed calling decision regarding which number to call.

In an embodiment, cost information may be provided based on associated calling plans. As illustrated by FIG. 3, the price table database may include cost information such as mobile providers' calling plans 300, a cost-per-minute value 305 associated with the calling plans, a dialing prefix 310 provisioned for each calling plan and/or the like. In an embodiment, the price table database may receive this cost information from the price feed on a regularly updated basis.

In an embodiment, the mapper may map a contact's number with the subscriber's calling plan and the corresponding cost information may be displayed to a subscriber. One or more contacts in a subscriber's address book may be displayed with cost information based on the subscriber's and/or the contact's calling plan. For example, FIG. 3 illustrates exemplary information that may be displayed on a mobile device. A contact's number 315 may be listed with a cost-perminute value 320 and a calling plan 325 associated with the number 315.

In an embodiment, the mapper may use a contact's phone number to determine calling destination information such as a contact's locale, whether the contact's number corresponds to a landline or a mobile phone or the like. After calling destination information is determined, the mapper may map at least a portion of the calling destination information to the subscriber's calling plan. For example, a subscriber may want to call a contact who has two numbers. The first number may be a landline in Israel while the second number may be a mobile phone in Israel. The mapper may match the subscriber's calling plan with the destination information to determine that cost information associated with calling the two

In an embodiment, multiple service providers may be used to place a call. In such an embodiment, the mapper may map cost information associated with all necessary providers so that a combined price may be displayed to a subscriber. For example, if a subscriber calls an overseas contact using a long-distance service provider, the cost-per-minute may reflect both the long distance provider's charges as well as the local mobile carrier's airtime charges.

FIG. 4 depicts an environment suitable for practicing the illustrative embodiments. A processor, such as a server 400 may include a mapper 405 and/or a price table database 410. The server 400 may be in communication with a price feed 415 and one or more mobile devices 420 via a network 425. The server 400 may be implemented on a stand-alone computer system or may be implemented by distributed components such as separate electronic devices.

In an embodiment, a subscriber may use a local access number to place a long distance call. A local access number is a local telephone number a subscriber may employ to connect to a certain long distance service provider. FIG. 5 illustrates an exemplary flow chart of a method for assigning a local access number according to an embodiment. A subscriber's locale information may be received 500 by a server. In an embodiment, a subscriber may use a mobile device to subscribe to a telecommunication service via a data line. For example, a subscriber may access a browser to transmit an HTTP request. Upon registration, a subscriber may provide locale information such as an area code and a telephone

number, a zip code or the like corresponding to the subscriber's current location. The locale information may be communicated to a server

In another embodiment, locale information may be automatically received **500** by a server. For example, the locale 5 information may be transmitted via an HTTP browser to a server where it may be processed by a service delivery framework (SDF). The SDF may be aware of the subscriber locale information, such as a Mobile Systems International Subscriber identity Number (MSISDN), and may insert such 10 information into an HTTP header. The header may be transmitted to the server where the mapper may extract the locale information.

In an embodiment, the mapper may map **510** the locale information to a database of available access numbers. A local 15 access number may be identified **520** based on the subscriber's current location and the identified local access number may be transmitted **530** to the subscriber's mobile device.

In an embodiment, the mapper may generate a list of long distance service providers having local access numbers corresponding to the subscriber's locale. The server may transmit the list via a data line to the subscriber's mobile device. The subscriber may select a long distance service provider, and may receive the corresponding local access number on his mobile device.

In an embodiment, the subscriber may use the local access number to connect to a chosen long distance service provider. The subscriber may manually input the local access number, followed by the desired long-distance phone number. Alternatively, the subscriber may employ an application, such as an address book, to automate this process. For example, a mobile device's address book may include a long-distance automatic dialing feature that allows for quick-dialing of a previously entered local access code.

In an embodiment, an existing address book may be populated with the local access number for future retrieval. In an embodiment, as a subscriber travels, his mobile device may receive and store new local access numbers based on his current location.

FIG. 6 illustrates a method of placing a long distance call 40 using a local access number according to an embodiment. For example, subscriber who wants to make a third-party long distance call may register 600 for a long distance service using a browser on his mobile device. Upon registration, the subscriber may be asked to provide 605 locale information, 45 such as a local telephone number with an area code. The locale information may be processed 610 by the server, and the subscriber may receive 615 a list of one or more long distance service providers. The subscriber may select 620 a long distance service provider and may receive 625 a local 50 access number based on the selected long distance provider on his mobile device. The subscriber may employ the local access number for as long as he remains in his current location. If the subscriber's address book is equipped with a long distance auto-dial feature, it may be automatically populated 55 with the local access number when the server transmits it to the mobile device. If the subscriber changes locations, he may access his account on the subscription site, enter a new telephone number and area code, and receive a new local access number. The subscriber's old access number may be stored 60

In an embodiment, a local access number may be automatically dialed for the subscriber, and may or may not require subscriber confirmation. As such, the subscriber may only need to specify the preferred long distance number to call. For 65 example, a subscriber may select or input the preferred long distance number to call, and an application on the mobile

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device may place the call by automatically dialing the access code local to the subscriber's local information. As described above, the locale information may be ascertained based on the telephone number provided by the subscriber at sign-up or by extracting the subscriber locale information from an HTTP header.

For example, a mobile user who wants to place a long distance call may select a contact from his address book to call. The subscriber's long distance subscription service may ascertain the subscriber's location by extracting locale information from an HTTP header transmitted by the subscriber's phone or by the locale information the subscriber provided at sign-up. The server may map the subscriber's location to an appropriate local access number which may be sent to the subscriber's mobile device. The subscriber may make one or more selections to dial the received local access number. Alternatively, the service may auto-dial the local access number and connect the call without the subscriber being aware that a local access number has been dialed.

FIG. 7 illustrates a flow chart for an exemplary method of accessing contact information on a subscriber's mobile device according to an embodiment. When a subscriber first accesses a server-based mobile address book application, the subscriber may experience a significant delay while the address book attempts to retrieve the subscriber's address book from the server. In an embodiment, a cache of the address book may be created 700 before the subscriber's mobile device is powered off. The cache may include contact information stored in the subscriber's address book during the last application session. For example, the cache may include a contact's name, one or more telephone numbers associated with the contact, a status message associated with the contact and/or the like.

In an embodiment, a status message indicates whether the contact is online, offline or the like. A status message includes information relating to a status or state of a subscriber, and can be presented automatically to anyone who attempts to contact the subscriber. The status message may provide further information regarding the subscriber. In an embodiment, exemplary status messages may include "Having a bad day," "In a meeting," "At the gym," or the like.

In an embodiment, the cache may be stored 710 on the subscriber's mobile device. When a subscriber powers on his mobile device, at least a portion of the cache may be displayed 720 to a subscriber until a fresh upload of contact information can be obtained from the server. For example, when a subscriber accesses an address book application after powering on his mobile device, the subscriber may be presented with a cached version of his address book that may include contacts' names, telephone numbers, status message and/or the like which were stored in the cache prior to the mobile device being powered off.

In an embodiment, because the server may take a significant amount of time to upload a complete fresh address book, contacts may be updated in a particular order according to an embodiment. For example, the first several contacts that appear in a subscriber's mobile device display may have their information updated first. Alternatively, priority may be given to one or more pre-determined contacts.

A problem may arise when a subscriber attempts to call a contact's telephone number using a cached address book. In an embodiment, the cached information may include a contact identification number associated with a contact and/or a unique session identification number. A contact identification number is a unique identifier associated with a certain contact in an address book. A session identification number is a unique identifier associated with a calling period. The unique

session identification number may remain valid for the length of an entire calling period, which, in an embodiment, may be the period of time from when the application is powered up and connected until the time that the application is powered down. A contact identification number may be assigned to 5 each contact, and may remain valid for the duration of a calling period. In an embodiment, the unique session identification number and the contact identification numbers may expire after the calling period has closed, thus rendering them invalid for subsequent calling sessions. As such, when a sub- 10 scriber attempts to call a contact with stale status information, the application may attempt to dial in with an expired session identification number and/or reference an expired contact identification number, which may result in call failure. While a delay may exist while the server refreshes and updates a 15 subscriber's contact information, a service provider may want to give a subscriber a feeling of being logged onto the network as soon as the subscriber's mobile device is powered

For example, in an embodiment, if a subscriber selects a 20 contact from the cached address book having expired status information, the contact's phone number may not be immediately dialed. Instead, the subscriber's mobile device may dial a server and may dispatch the name of the desired callee across a network. The server may send back a session identification number to be utilized during the calling period and/or a contact information number that references the callee. In an embodiment, the server may also send a local access number to be used to contact the callee. Alternatively, the call may be completed without the use of a local access 30 number.

In an embodiment, if a subscriber selects a contact from the cached contact list having stale status information, a prepare call may be sent to the server. The prepare call may include a session identification number, a callee's contact identification 35 number, a callee's contact name and the like. The server may send back a new session identification number for the subscriber, a contact information number that references the callee, a local access number to be used to contact the callee and/or the like.

In an embodiment, if a subscriber selects a contact from the cached contact list having stale status information, a direct inward dialing (DID) number of the callee may be directly dialed, and the dual-tone multi-frequency (DTMF) tones of the caller may be appended to a dial-string associated with the call. A DID number is a feature offered by telephone companies for use with customer's private branch exchange. A telephone company may allocate a range of numbers all connected to the customers' PBX. As the PBX receives calls, the number that the caller dialed may also be presented so the 50 PBX can route the call to the target callee. For example, DID numbers may be obtained by administrators of a VoIP network and assigned to a gateway in the network. The gateway may route incoming calls from the network to appropriate VoIP subscribers.

In an embodiment, a set of DIDs may be assigned to a gateway. The gateway may then reassign the DIDs to a particular mapping of caller-callee. For example, Caller A may have ten contacts, A-K. Each contact may be assigned a unique DID number. When Caller A selects a contact from his cached contact list, Caller A is, in effect, selecting the DID number associated with the contact.

In an embodiment, if a subscriber selects a contact from the cached contact list having expired status information, a callee's DID number may be directly dialed, and the DID 65 number and the identification number of the caller may appear within the dial-string.

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In an embodiment, a subscriber may use an address book on the subscriber's mobile device to call one or more contacts stored in the address book. The subscriber may communicate with these contacts by dialing the contact directly, by sending chat messages or the like. FIG. 8 illustrates an exemplary system for implementing mobile address book interaction according to an embodiment. In addition to being stored locally on a mobile device 800, the contact information in a subscriber's address book 805 may also be cached on a server 810 which may regularly update the address book information. The server may send information about the subscriber's contacts to the subscriber's mobile device 800 as it become available. In an embodiment, the subscriber's mobile device 800 may poll the server at specified intervals to receive updates about the subscriber's contacts. Updated information may he integrated into the subscriber's mobile address book 805 for the subscriber to access. In an embodiment, contact information may include a status message or the like.

As FIG. 8 illustrates, bidirectional communication 815 may exist between the server, the subscriber's mobile device and the contacts 820 who appear in the subscriber's address book. In an embodiment, the server may push information, such as a status message associated with the subscriber, to the contacts 820. The server may also pull information from the contacts 820 for transmission to the subscriber's mobile device.

For example, if the subscriber wishes to change his status message, the subscriber may set a new status message using his mobile device. The new status message may then be sent to the server to be propagated to the subscriber's contacts. When the server receives and processes the new status message, the server may send the new status message to all of the subscriber's contacts.

FIG. 9 illustrates a method of providing contact information according to an embodiment. A server may receive 900
one or more status messages, such as a holographic message,
from a subscriber's mobile device. A holographic message
relates to customized messages that differ based on which
contact inquires about the subscriber's status. That is, different contacts may be presented with different messages
depending on the identity of the contact. The present discussion is intended to comprehend a one-to-one correspondence
between messages and contacts, but is not so limited, and also
includes messages directed to subsets of more than one contact. For example, a subscriber's holographic message may
read "I'm in a meeting" to work colleagues, but may read
"I'm unavailable" to all other contacts.

In an embodiment, a subscriber may set a holographic message using the subscriber's mobile phone. The subscriber may identify a message for a specific contact. For example, a subscriber may set a holographic message that reads "I'll be home at 6:30 pm" to his wife. The subscriber may also set a holographic message for a specific contact group. For example, a subscriber may set a holographic message that 55 reads "At the beach" to his friends.

In an embodiment, the holographic messages set by a subscriber may be sent to the server to be transmitted to the contacts in the subscriber's contact book. The server may store 910 a holographic message and corresponding contact or contact group. The server may transmit 920 the holographic message to the mobile phones of the appropriate contacts based on the contact's name, the contact's group or the like. In an embodiment, the server may integrate 930 the holographic message into an address book associated with a contact. The server may transmit one or more instructions to a contact's mobile device instructing the mobile device to display the holographic message.

In an embodiment, a list of most-recently called contacts may be kept. For example, the list may reflect the last ten contacts a subscriber called, chatted with, changed a status message for, or the like. Typically, a subscriber's address book is stored on a server, and a push presence technique is 5 utilized to access contact information, such as a status message or the like. In an embodiment, the push presence technique requires a subscriber to retrieve the latest contact information from the server. However, a subscriber who as many contacts must access the server numerous times in order to view contact information, which may drain the battery of the subscriber's mobile device. As such, a list of most-recently called contacts may be kept. This list may be stored on a subscriber's mobile device or on the server. If the list is stored on the server, the server must only push the contact information associated with the contacts in the most-recently called list instead of the contact information for every contact in the subscriber's address book.

It will be appreciated that various of the above-disclosed and other features and functions, or alternatives thereof, may 20 be desirably combined into many other different systems or applications. Also that various presently unforeseen or unanticipated alternatives, modifications, variations or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the 25 following claims.

What is claimed is:

1. A method of providing a local access number to a subscriber, the method comprising:

receiving, from the subscriber's mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is received from the subscriber upon registration for a long distance service, and wherein the subscriber locale 35 information corresponds to a telephone number, an area code, and/or a zip code;

determining a list of a plurality of long-distance providers that each include one or more local access numbers that correspond to the subscriber locale information, 40 wherein the plurality of long-distance providers are configured to support a long distance service for calls that originate from the location of the subscriber and are directed to one of their respective local access numbers; transmitting the list to the subscriber's mobile device; 45

receiving, from the subscriber's mobile device, a selection of one of the listed long-distance service providers; and transmitting, to the subscriber's mobile device in response to the received selection, the one or more local access numbers associated with the selected long-distance ser-

vice provider.

- 2. The method of claim 1, wherein the subscriber locale information is received via a browser on the subscriber's mobile device.
- 3. A method of obtaining a local access number at a mobile 55 device of a subscriber, the method comprising:

transmitting, from the mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is provided by the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

receiving, at the mobile device, a list of one or more long distance service providers in response to the transmission, wherein the one or more long-distance service providers are configured to support long distance service 10

for calls that originate from the location of the subscriber and are directed to an associated local access number;

selecting a long distance service provider from the list; and receiving a local access number that is associated with the selected long distance service provider at the location of the subscriber, wherein the received local access number is configured to be used by the mobile device at the

location of the subscriber to obtain long-distance service

- from the selected long distance service provider.

 4. The method of claim 3, wherein the subscriber locale information is transmitted via a browser on the mobile device.
 - 5. The method of claim 3, further comprising:
 - populating an address book on the mobile device with the local access number.
- **6**. A server configured to provide a local access number to a subscriber, comprising:

means for receiving, from the subscriber's mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is received from the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

means for determining a list of a plurality of long-distance providers that each include one or more local access numbers that correspond to the subscriber locale information, wherein the plurality of long-distance providers are configured to support a long distance service for calls that originate from the location of the subscriber and are directed to one of their respective local access numbers;

means for transmitting the list to the subscriber's mobile device;

means for receiving, from the subscriber's mobile device, a selection of one of the listed long-distance service providers; and

means for transmitting, to the subscriber's mobile device in response to the received selection, the one or more local access numbers associated with the selected long-distance service provider.

7. A mobile device of a subscriber that is configured to obtain a local access number, comprising:

means for transmitting, from the mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is provided by the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

means for receiving a list of one or more long distance service providers in response to the transmission, wherein the one or more long-distance service providers are configured to support long distance service for calls that originate from the location of the subscriber and are directed to an associated local access number;

means for selecting a long distance service provider from the list; and

means for receiving a local access number that is associated with the selected long distance service provider at the location of the subscriber, wherein the received local access number is configured to be used by the mobile device at the location of the subscriber to obtain long-distance service from the selected long distance service provider.

8. A non-transitory computer-readable storage medium containing instructions stored thereon, which, when executed by a server configured to provide a local access number to a subscriber, cause the server to perform operations, the instructions comprising:

program code to receive, from the subscriber's mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is received from the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

program code to determine a list of a plurality of longdistance providers that each include one or more local access numbers that correspond to the subscriber locale information, wherein the plurality of long-distance providers are configured to support a long distance service for calls that originate from the location of the subscriber and are directed to one of their respective local access numbers:

program code to transmit the list to the subscriber's mobile device:

program code to receive, from the subscriber's mobile device, a selection of one of the listed long-distance service providers; and

program code to transmit, to the subscriber's mobile device in response to the received selection, the one or more local access numbers associated with the selected longdistance service provider.

9. A non-transitory computer-readable storage medium containing instructions stored thereon, which, when executed by a mobile device of a subscriber that is configured to obtain a local access number, cause the mobile device to perform operations, the instructions comprising:

program code to transmit, from the mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is provided by the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

program code to receive a list of one or more long distance service providers in response to the transmission, wherein the one or more long-distance service providers are configured to support long distance service for calls that originate from the location of the subscriber and are directed to an associated local access number;

program code to select a long distance service provider from the list; and

program code to receive a local access number that is associated with the selected long distance service provider at the location of the subscriber, wherein the received local access number is configured to be used by the mobile device at the location of the subscriber to obtain long-distance service from the selected long distance service provider.

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10. A server configured to provide a local access number to a subscriber, comprising:

a processor-readable storage medium; and

a processor coupled to the processor-readable storage medium and configured to:

receive, from the subscriber's mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is received from the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

determine a list of a plurality of long-distance providers that each include one or more local access numbers that correspond to the subscriber locale information, wherein the plurality of long-distance providers are configured to support a long distance service for calls that originate from the location of the subscriber and are directed to one of their respective local access numbers:

transmit the list to the subscriber's mobile device;

receive, from the subscriber's mobile device, a selection of one of the listed long-distance service providers; and

transmit, to the subscriber's mobile device in response to the received selection, the one or more local access numbers associated with the selected long-distance service provider.

11. A mobile device of a subscriber that is configured to obtain a local access number, comprising:

a processor-readable storage medium; and

a processor coupled to the processor-readable storage medium and configured to:

transmit, from the mobile device, subscriber locale information indicating a location of the subscriber, wherein the subscriber locale information is provided by the subscriber upon registration for a long distance service, and wherein the subscriber locale information corresponds to a telephone number, an area code, and/or a zip code;

receive a list of one or more long distance service providers in response to the transmission, wherein the one or more long-distance service providers are configured to support long distance service for calls that originate from the location of the subscriber and are directed to an associated local access number;

select a long distance service provider from the list; and receive a local access number that is associated with the selected long distance service provider at the location of the subscriber, wherein the received local access number is configured to be used by the mobile device at the location of the subscriber to obtain long-distance service from the selected long distance service provider.

12. The method of claim 1, wherein the subscriber provides the subscriber locale information upon registration for the long distance service via an Internet browser.

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